

Suppression of two-spotted spider mite (*Tetranychus urticae*), mealy bug (*Pseudococcus sp*) and aphid (*Myzus persicae*) populations and damage by vermicomposts

Arancon, Norman Q.¹; Edwards, Clive A.¹; Yardim, Erdal N.¹; Oliver, Thomas J.¹; Byrne, Robert J.¹; Keeney, George¹

1. Soil Ecology Laboratory, Department of Entomology, 400 Aronoff Laboratory, 318 W. 12th Ave., Columbus, OH 43210, USA

A vermicompost, produced commercially from food wastes, was tested for its capacity to suppress populations and damage to plants, by *two-spotted spider mites* (*Tetranychus urticae*), mealy bugs (*Pseudococcus sp.*) and aphids (*Myzus persicae*), in the greenhouse. A range of mixtures of food waste vermicompost and a soil-less bedding plant growth medium Metro-Mix 360 (MM360) was tested in cages (40cm × 40cm × 40cm) (0.2mm mesh aperture) into which known numbers of greenhouse-bred pests were released. The crops tested were cucumbers and tomatoes for mealy bugs, bush beans and eggplants for *spider mites*, and cabbages for aphids. In all experiments, four 10cm diameter pots, each containing one seedling, grown in the same MM360/vermicompost mixture were exposed to either 50 mealy bugs, 100 *spider mites*, or 100 aphids in cages, with each cage treatment replicated 4 times per treatment. The five growth mixtures tested were: (i) 100% MM360; (ii) 90% MM360 with 10% vermicompost; (iii) 80% MM360 with 20% vermicompost; (iv) 60% MM360 with 40% vermicompost; and (v) 20% MM360 with 80% vermicompost. Almost all of the mixtures containing vermicomposts suppressed the arthropod pest populations, and decreased pest damage significantly, compared with the MM360 controls. Not only did the vermicomposts make the plants less attractive to the pests, but they also had considerable effects on pest reproduction over time. The effects of the vermicompost substitutions tended to be least on *spider mites*, intermediate on mealy bugs, and greatest on aphids; however this may relate to the motility of the pests, as well as to the *suppression* potential of vermicomposts. Possible mechanisms for the *suppression* discussed include: the form of nitrogen available in the leaf tissues, the effects of vermicomposts on micronutrient availability, and the possible production of phenols, by the plants after applications of vermicomposts, making the tissues unpalatable.